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WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE FISH AND WILDLIFE SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

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Chicago, Ill. No. 49 June, 1947

Classification: Fleas

Hubbard, Clarence A. Fleas of western North America. Their relation to public health. Iowa State College Press (Ames. $6.00 a copy), ix+533 pp., 5 pls., 235 figs., tables, 1947.

A comprehensive and thorough work, prepared with due regard to the history of the subject and appreciation of the work of other men, portraits of 14 of whom are reproduced. Their contributions are described and varying amounts of biographical data are given. In an account of the medical importance of fleas, the role of these insects in transmitting bubonic plague, typhus fever, and tularemia is discussed; allergy to flea bites and the role of fleas as household and farm pests also are considered. Instructions are given for the collecting and studying of fleas. There is an illustrated section on the anatomy of fleas in relation to their taxonomy. The systematic treatment comprises keys to suborders, families, genera, and species; accounts of some 230 species and subspecies are included. Diagnostic characters of each form recognized are illustrated and described. Host records and distribution are listed and biology, economic and medical importance are treated. A table records the occurrence of the forms treated in 16 western states, 3 Canadian provinces, and Alaska. A section on hosts traces and maps the spread of plague infection, 1902-43, and includes brief accounts of groups of mammals and birds, noting the fleas affecting each and discussing their relation to human diseases. There is a 4-page bibliography and ample synonymic and other indexes. Another of the valuable monographs so fortunately prevalent that give the modern student tools of which those of preceding generations could only dream.

Conservation: Duck, Black

Gabrielson, Ira N. A program for the black duck, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 17(11), Feb. 1947, pp. 8-9, 31, 1 photo, 2 maps.

Due to overshooting and loss of habitat in the United States, the black duck is in the most precarious status in its known history. The range of the species is discussed, especially in relation to possibilities of restoration. A map of the breeding and wintering ranges indicates that the greatest opportunity to help this species lies in and adjacent to the coastal marshes from Maine to Carolina. Information is given on all of the Federal wildlife refuges in this area, especially as to their value to the black duck. Related state activities also are reviewed. A program for management and restoration of the species is proposed.

Conservation: Range

Wagar, J. V. K. The contest for western public game fields, Journ. Forestry (825 Mills Bldg., Washington 6, D. C. 60 cents a copy), 45(5), May 1947, pp. 323-328.

"Western public lands . . . are not game fields alone, but they are primarily that . . . to hunters, fishermen, and naturalists . . . They are prin-

cipally national forest and national grazing lands, and in lesser acreage, national parks." There is relatively little mention of game in this article but a point is made of the conflict between stockmen and sportsmen interests, and the competition of big game and livestock for forage, and especially winter range, is noted. "Antelope herds are particularly dependent upon Taylor grazing lands for their continued existence." Livestock interests are trying to get control of public lands, but if they succeed, can we doubt that as in the East the public will have to buy the tracts again for public uses. The author thinks we should be slow to change existing land policies for without full knowledge "we may destroy our substance and all that is fair and good." Bibliography of 12 titles.

Conservation: Waterfowl

Baker, John H. Let's face the waterfowl crisis, Audubon Magazine (1000 Fifth Ave., New York 28, N. Y. 45 cents a copy), 49(2), March-April 1947, pp. 66-70, photos.

Accompanied by a reproduction of the author's address at the latest N. A. Wildlife Conference (Wildfowling is not necessarily on the way out, pp. 71-73, photos). These articles cite the decline of waterfowl at a time when the number of hunters has notably increased. The only quick relief is reduction of hunting pressure so the President of the National Audubon Society "advocates that the hunting of migratory waterfowl in North America be discontinued for a year, with the understanding that during that time basic revisions of management and regulation policies be worked out and adopted."

Control: Aquatic plants

Surber, Eugene W. Aquatic plant control with 2, 4-D. U. S. Fish and Wildlife Service (Merchandise Mart, Chicago 54, Ill.), Fishery Leaflet 217, 5 pp., 1 table (stencilled), March 1947.

Summary of the results of experiments in the control of: Cattail, spikerush, round-stem bulrush, burreed, willow, and waterlilies, successful with all but the last group. The composition and preparation of spray solutions and methods of application are discussed.

Control: Seed destruction

Smith, Clarence F., and Shaler E. Aldous. The influence of mammals and birds in retarding artificial and natural reseeding of coniferous forests in the United States, Journ. Forestry (825 Mills Bldg., Washington 6, D. C. 60 cents a copy), 45(5), May 1947, pp. 361-369, 1 table.

"A total of 44 small mammal and 37 bird species have been found to eat coniferous seeds." These creatures, however, are not the sole factors preventing reforestation and they act to distribute and plant, as well as to destroy, seeds. The species known to consume conifer seeds are listed in a table that includes reference to the sources of the information. The quantity of seeds consumed by mammals and birds is discussed and control measures are considered.

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From authors' summary: "Reductional control of animal life has not been particularly successful due to the fast rate of reinvasion on controlled areas, and the long period before germination of many of the seeds takes place. There is still hope that new toxic agents may increase the effectiveness of this method. Control in the past has been and will continue to be aimed principally against small rodents. Repellent materials applied to the seeds and seed spots have not been particularly successful but some promise is held for this method. Mechanical protection by means of wire screens has consistently produced the best results but the cost has usually been prohibitive except on experimental areas. The lowest cost of screen protection was reported to be $3.87 per acre (1940 prices). Cultural practices seem to improve results with certain seed species such as jack pine but have not been of much value in protecting the slower germinating species. There have been enough successes in recent years in spite of the numerous failures that a continuation of these investigations will be made in the hope of finding a method that can insure satisfactory restocking in spite of animal pressure and other adverse factors of which there are many." Bibliography of 65 titles.

Diseases and Parasites: Encephalomyelitis

Reeves, W. C., et al. Recovery of western equine encephalomyelitis virus from wild bird mites (Liponyssus sylviarum) in Kern County, California, Science (1515 Massachusetts Ave., N. W., Washington 5, D. C. 25 cents a copy), 105(2729), April 18, 1947, pp. 411-412.

The mites, obtained from nests of the yellow-headed blackbird and the English sparrow, included Dermanyssus americanus besides the species mentioned in the title. Review of cognate findings by other investigators (8 titles of literature cited). The mites may be, but have not been proved to be, vectors of the disease.

Diseases and Parasites: Listeriosis

Gifford, Rebecca, and Erwin Jungherr. Listeriosis in Connecticut with particular reference to a septicemic case in a wild raccoon, Cornell Veterinarian (124 Roberts Place, Ithaca, N. Y. 75 cents a copy), 37(1), Jan. 1947, pp. 39-48, 4 figs.

Review of the occurrence of listeriosis (causative organism Listeria monocytogenes) mostly in domestic and captive animals and report on its determination in a raccoon. Macroscopic and microscopic lesions are described and the latter figured. Apparently the first recorded instance of the disease in a wild animal in the United States. Bibliography of 32 titles.

Diseases and Parasites: Plague

Anon. Plague infection reported in the United States in 1945, U. S. Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 62(12), March 21, 1947, pp. 431-433, table.

No human case was reported. Infection in 4 species of ground squirrels, 3 of mice, and 1 wood rat, and from rodent parasites are reported and the circumstances of the findings tabulated. Plague was identified farther east than before in Cheyenne and Morton Counties, Kansas.

Diseases and Parasites: Plague

Prince, F. M., and N. E. Mayson. Plague--The survival of the infection in fleas or hibernating ground squirrels, U. S. Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 62(13), March 28, 1947, pp. 463-467.

Authors' summary: "Six hibernating ground squirrels were stored for 4 months at 40° F. in separate nests. Two squirrels were inoculated with plague, and each seeded with 100 normal fleas. One squirrel died of plague, and one recovered. Twenty-three fleas of this lot were recovered alive at the end of 4 months and contained no plague germs. Two squirrels were each seeded with 100 infected fleas. One of the fourteen live fleas recovered from them retained P. pestis in a virulent form and produced plague when injected into a white mouse. The squirrels did not become infected. Two squirrels were seeded with 100 normal fleas each. Fifty percent of the fleas were recovered and were able to reproduce."

Diseases and Parasites: Typhus

Davis, David E. The use of DDT to control murine typhus fever in San Antonio, Texas, U. S. Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 62(13), March 28, 1947, pp. 449-463, 1 folded map, 5 tables.

History of typhus fever and efforts to control it in San Antonio and account of an experiment with DDT in reducing the number of the rat fleas that transmit the disease. It is concluded that the method is of probable value in typhus control.

Diseases and Parasites: Acarina, Ascariscus

Farner, Donald S. New records for Oryzomys palustris (Harlan) and Ascariscus masoni Ewing, Proc. Biol. Soc. Wash. (c/o U. S. National Museum, Washington 25, D. C.), 60, pp. 29-30, April 1947.

In Maryland, the chiggers on the rice rats. Bibliography of 7 titles.

Diseases and Parasites: Acarina, Atricholaelaps

Strandtmann, R. W. Atricholaelaps megaventralis, a new species of parasitic mite (Acarina, Laelaptidae), Proc. Entomological Soc. Washington (Bureau of Entomology and Plant Quarantine, Washington 25, D. C. 50 cents a copy), 49(4), April 1947, pp. 112-114, pl. 11).

Description, measurements, illustrations; from gray squirrel, Georgia; recorded from several other southeastern localities, and from a number each of rodents and birds.

Diseases and Parasites: Acarina, Ichoronyssus

Strandtmann, R. W., and R. B. Eads. A new species of mite, Ichoronyssus dentipes (Acarina: Liponyssinae), from the cotton rat, Journ. Parasitology (R. M. Stabler, University of Pennsylvania, Philadelphia 4), 33(1), Feb. 1947, pp. 51-56, 3 pls.

From Texas; description, measurements, illustrations, comparative notes. Bibliography of 5 titles.

Diseases and Parasites: Acarina, Ixodes

Bilsing, S. W., and R. B. Eads. An addition to the tick fauna of the United States, Journ. Parasitology (R. M. Stabler, University of Pennsylvania, Philadelphia 4), 33(1), Feb. 1947, pp. 85-86.

Amblyomma humerale from Terrapene ornata, Texas.

Diseases and Parasites: Acarina, Ixodes

Kohls, Glen M. Notes on the tick, Ixodes howelli Cooley and Kohls, with descriptions, Journ. Parasitology (R. M. Stabler, University of Pennsylvania, Philadelphia 4), 33(1), Feb. 1947, pp. 57-61, 2 figs.

From cliff swallows, California. Description, measurements, illustrations, comparative notes. "There was no evidence to suggest that the ticks were feeding on any host other than swallows. The abundance of these ticks, and the presence of other ectoparasites including the tick Argas reflexus, dipterous larvae (Protocalliphora sp.), fleas (Ceratophyllus petrochelidoni), and countless numbers of swallow bugs (Cimicidae), are sufficient grounds for suspecting that the parasite burden was responsible for the fatalities noted among the nestling birds. The three nestlings examined were in an obviously weakened condition."

Diseases and Parasites: Acarina, Ornithodoros

Williams, Ralph B. Infestation of raptorials by Ornithodoros aquilae, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(2), April 1947, pp. 185-188, 2 pls.

Of prairie falcon, sparrow hawk, and golden eagle nestlings in Colorado. The species was described by R. A. Cooley (Journ. Parasitology, 30, 1944, pp. 287-294) from reared specimens; the adult has not yet been found in nature. A mallophagan Degeeriella fusca also was collected from the raptors. Bibliography of 5 titles.

Diseases and Parasites: Cestoda, Hymenolepis

Webster, J. Dan. Studies on the genus Hymenolepis, with descriptions of three new species, Journ. Parasitology (R. M. Stabler, University of Pennsylvania, Philadelphia 4), 33(2), April 1947, pp. 99-106, 1 pl., 1 fig.

Diagnoses, measurements, and illustrations of the three new species, which are from the piping plover, sanderling, and ruddy turnstone, all from Texas. There are comparative notes, comment on the identity of Taenia fusus Krabbe, and discussion of subdivisions of the genus Hymenolepis. Bibliography of 25 titles.

Diseases and Parasites: Diptera, Protocalliphora

Hill, Harold M., and Telford H. Work. Protocalliphora larvae infesting nestling birds of prey, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(2), March-April 1947, pp. 74-75, 1 fig.

In the ears and nostrils of young sparrow hawks and in the ears of nestling golden eagles. Review of certain previous literature and comment on the fly larvae as the cause of bird mortality.

Diseases and Parasites: Bacteria, Salmonella

Rhoades, Harry E. Salmonella bareilly in quail, North American Veterinarian (Box 550, Evanston, Ill. 50 cents a copy), 27(7), July 1946, p. 419.

An epizootic on a state game farm in Illinois, with 1,200 birds affected and a 60 percent mortality was caused by the organism named. History and symptoms. Bibliography of 5 titles.

Diseases and Parasites: Of coot

Rausch, Robert. Pullorum disease in the coot, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, p. 189.

Salmonella pullorum in one specimen from Ohio.

Ecology: Deer, White-tailed, in Wisconsin

Buss, Irven O., and Herman E. Buss. Deer hunting records from central Bayfield County, 1930-1946, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison), 12(1), Jan. 1947, pp. 5-11, 1 photo, tables.

Records of a hunting party for 14 seasons tabulated and discussed; the article contains information on kill, hunting effort and success, weights and sex ratio of deer, number of deer and other game species observed during 7 seasons, browse conditions, and population fluctuations, some cyclic. Bibliography of 13 titles.

Ecology: Desert in Utah

Fautin, Reed W. Biotic communities of the northern desert shrub biome in western Utah, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 16(4), Oct. 1946, pp. 251-310, 19 figs., 33 tables.

The study area is defined, mapped, and described, and the methods of investigation set forth. Climatic factors are outlined and the ecological communities discussed. The scope is wide and includes birds and mammals, for which life history, food habit, and other data are recorded. Adaptations are given much attention and the paper is summarized. Extensive bibliography.

Ecology: Forest edge

Johnston, Verna R. Breeding birds of the forest edge in Illinois, Condor (J. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(2), March-April 1947, pp. 45-53, 3 figs., 1 table.

Report on a summer study in Champaign County. The area of the investigation is described and the results reported for the more important species. The table shows the number of breeding pairs of birds in the edge and in the interior of two woodlands. Their behavior adjustments are described and discussed. Author's summary: "In a study of two central Illinois forests in the summer of 1943, fourteen species of birds were found to occur primarily along the forest edge and ten species in the forest interior. The Crested Flycatcher, Wood Pewee, Indigo Bunting, and House Wren were found in both habitats. Males of the Ruby-throated Hummingbird were forest-edge birds, the females forest-interior birds. The densities of the two forest-edge populations studied were 73 and 62.5 birds per mile, respectively; the densities of the forest-interior populations were 106 and 74 birds per 100 acres, respectively. The forest edge is considered to be a distinct community because it is inhabited by a characteristic set of species and because some, at least, of the birds which inhabit it display psychological adjustments to particular niches available only in the forest edge." Bibliography of 17 titles.

Ecology: Grouse, Ruffed

Edminster, Frank C. The ruffed grouse. Its life story, ecology and management. Macmillan Company (New York. $5.00 a copy), xxvi+385 pp., 56 pls., 17 figs., cartoons, 10 tables, 1947.

The author was employed more than seven years in the ruffed grouse investigation of the New York State Conservation Department. The results of this and other experience, and gleanings from literature (cited in connection with the sections), have been combined to make this book. Chapters are devoted to the classification and characteristics of the bird, its history in the eastern United States, and its life history, ecology, and management. Ecology is treated in greatest detail, with attention to: shelter, food and water, weather conditions in relation to grouse, interrelationships of the species with mammals and other birds, diseases and parasites, influences of man, and productivity and populations. Management suggestions relate to manipulation of cover and food plants, provision of dusting and drumming places, and control of the harvest.

Considering the wealth of technical information presented, the text has been kept readable and the author's independent views are clearly but not aggressively expressed. Discussion of predation and of population fluctuations is restrained and sensible and the management suggestions, embodying the author's specialized knowledge of woody cover plants, are practical. Excellent guides to the management of game species, of which this is a peer, are available in formerly undreamed of number; it is to be hoped that they will be heeded by all concerned in the conservation of wildlife.

Ecology: Populations, grouse, ruffed

Bowers, Glenn L., and Ward A. Tanner. Spring and summer populations of ruffed grouse in central Penna, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 17(12), March 1947, pp. 6-7, 3 photos.

Report of progress on a Cooperative Wildlife Research study at a low period of the grouse cycle. The authors describe the study areas and methods, give the results of population studies, and discuss limiting factors (heavy rainfall apparently most important). Mortality was almost wholly restricted to the young. The gain in number from spring to late summer in the two areas investigated was small: 17 to 27 and 32 to 38.

Ecology: Populations, small mammal

Mohr, Carl O. Table of equivalent populations of North American small mammals, American Midland Nat. (Notre Dame, Ind. $1.00 a copy), 37(1), Jan. 1947, pp. 223-249, 3 figs., 8 tables.

Supplement to his 1943 paper (See WILDLIFE REVIEW No. 38, Oct. 1943, p. 14), continuing a summary of the populations specified in the title. The longest table gives the various records that have been made of the number per acre, average individual weight, and grams per acre of the population of numerous species. Results published since 1941 are discussed by species. Causes of differing results of censusing are considered and home range investigation methods are summarized. Bibliography of 17 titles.

Ecology: Rabbits, Jack

Brown, H. Leo. Why has the white-tailed jack rabbit (Lepus townsendii campanius Hollister) become scarce in Kansas?, Trans. Kans. Acad. Sci. (Robert Taft, University of Kansas, Lawrence), 49(4), 1947, pp. 455-456.

Author's summary: "The change in distribution of the two species of jack rabbits in Kansas was gradual. The changes in environmental conditions when man began to break up the prairie and plant crops, especially wheat, seems to be the most reasonable explanation for the decrease in numbers of the white-tailed jack rabbit. The changing of the open prairie to cultivated land seemed to make conditions more favorable for the black-tailed jack rabbit to adapt itself to the new agricultural environment. This thought was reported by several of the early pioneers of western Kansas."

Ecology: Water plants

Steenis, John H. Recent changes in the marsh and aquatic plant status at Reelfoot Lake, Report of the Reelfoot Lake Biological Station (Tennessee Academy of Science, Nashville), 11, Jan. 1947, pp. 22-27.

Changes in vegetation due to silting, maintenance of water level, and cutting of channels between parts of the lake are briefly recorded. The results of cloudbursts occurring in June 1945 are discussed in some detail. Author's summary: "(1) The silt-laden flood waters . . . have altered the emergent, pad-leaf, and submergent plant types on Reelfoot Lake; (2) emergent type: The dominant Zizaniopsis miliacea has been thinned out. The perennial smartweed Polygonum hydropiperoides, has been set back severely, but P. muhlenbergii and P. portoricense were not affected so adversely; (3) pad-leaf type: Most of the Brasenia schreberi was killed. Nymphaea tuberosa and N. odorata were not affected. The more abundant Nuphar advena and Nelumbo pentapetala were curtailed severely and killed out in much of their range of growth; (4) submergent type: The dominant Ceratophyllum demersum has been reduced to fragmentary growth in most of the lake. The much-desired, previously suppressed, duck food plants, Potamogeton pectinatus, P. americanus, P. pusillus, Najas guadalupensis, Zannichellia palustris have produced expansive new growth."

Ecology: Woodchuck

Anon. Growth rate of trees in the vicinity of woodchuck burrows, Journ. Forestry (825 Hills Bldg., Washington 6, D. C. 60 cents a copy), 45(5), May 1947, pp. 372-373, 1 table.

Observations in New York and analyses of leaves of specimen and check trees. Conclusions: "The facts that woodchuck droppings are deposited in or near their burrows, that the roots of nearby trees had access to the mineral nutrients thus supplied and that these same trees actually obtained more nitrogen than did other trees farther from the burrows, lead to the conclusion that the increased growth rate of these trees is a result of their proximity to such burrows."

Economics: Muskrat

Scott, W. E. Muskrat farms, Wisconsin Conservation Bul. (Wisconsin Dept. of Conservation, Madison), 12(2), Feb. 1947, p. 16, 1 table.

"In the calendar year of 1945 there were 312 licensed muskrat fur farms in Wisconsin. Of this number, 221 reported harvesting some muskrats that year. This harvest amounted to 25,240 muskrats on a total licensed acreage of 32,126 acres of land. This average of less than one animal taken per acre is low because many acres licensed in these farms are non-productive. As a result, figures on rats per acre reflect largely the type of farm, rather than possible production per acre, although the latter factor enters the picture somewhat. The state-wide average value per muskrat pelt as reported was $2.20 (which is near ceiling price and may have correctly been higher). Using this figure, the value of all muskrats harvested from farms in 1945 was $55,593.13." "An

incidental summary of beaver and raccoon farms was made along with this study showing a total of 25 licensed beaver farms and 111 raccoon farms in the state in 1945."

Economics: Wildlife of Ontario

Anon. Fish and wildlife help to guarantee Ontario's future, Sylva (Dept. of Lands and Forests of Ontario, Toronto, Canada), 3(1), 1947, pp. 3-9, 5 photos.

As a recreational resource, stimulus to the tourist trade, from licenses to hunters, trappers, fur dealers, and fur farmers ($1,200,000 in 1944-45), from wild-trapped fur (some $5,000,000), and from ranch-raised pelts ($1,850,000). There are remarks also on the status of game species.

Education: Conservation

Knight, Owen. A functional approach to the teaching of conservation, Maryland Conservationist (513 Munsey Bldg., Baltimore 2, Md.), 24(1), Winter 1947 (May), pp. 2-3, 1 photo.

Through pupils participating in the field work necessary for the upkeep of State Game Propagation Areas. Books, however, are not neglected. Plans for expansion.

Education: Conservation

Weaver, Richard L. The introduction of natural resource planning in our schools of today, American Biology Teacher (403 California Ave., Royal Oak, Mich.), 9(4), Jan. 1947, pp. 109-116, 7 photos.

Conservation education is growing but should be made inclusive enough to encompass interests of the majority of the people. Conservation should be undertaken for the sake of the resources, not of selfish groups whose cooperation should be used only to an extent that will not endanger the main cause. Presentation of the subject should be practical and within possibility of execution by the schools. A series of projects is suggested of such scope that school officials can hardly say we have need of none of these. Suggestions are made as to teaching and a list is presented of source materials available from the states and from Federal and National agencies and periodicals.

Education: Nature study

Weaver, Richard L. The teaching of ecology, American Biology Teacher (403 California Ave., Royal Oak, Mich.), 9(6), March 1947, pp. 162-164.

The author premises that nature study and ecology are much the same thing. He traces the growth of nature study in the United States and urges the value of the ecological approach, especially as to the interrelationships of organisms among themselves and to man. The latter factor is a prime interest

winner. Nature study proponents should apply the results of ecological research to teaching and should promote the preparation of well-trained and inspiring teachers.

Education: Ornithology

Jaques, H. E. How to know the land birds. Wm. C. Brown and Co. (Dubuque, Iowa), [iv]+196 pp., 455 figs. 1947. (Price per copy: $1.50 with spiral, $2.50 with cloth, binding.)

"Some Explanations about Birds" occupy about 10 introductory pages, but the bulk of the book is made up of illustrated keys for the identification of birds to order, family, and species. Each species account is accompanied by a black and white figure and a tiny range map (U. S. base), besides descriptive notes and sometimes other remarks. The book includes a list of National and State birds, a combined index and pictured glossary. The book is well made and within the limitations of black and white illustration is well adapted to serve its purpose of enabling determination of all the land birds of the United States and southern Canada.

The same author and publisher provide a "Field Notebook for Studying Birds" (120 pp., $1.00 a copy).

Food Habits: Utilization of dogwoods

Chapman, Floyd B. The dogwoods in wildlife conservation, Ohio Conservation Bul. (1106 State Office Bldg., Columbus 15. 10 cents a copy), 11(4), April 1947, pp. 14-15, 3 photos.

Characteristic and commercial, and wildlife values of the Ohio species.

Food Habits: Of birds of prey

Lack, David. Competition for food by birds of prey, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 20 shillings a copy), 15(2), Nov. 1946, pp. 123-129.

Based primarily on data gleaned from a German paper on the food of hawks and owls, this article discusses diversity of prey, the food of closely related species and of those in different genera, predators on mammals, and temporary superabundant foods. An appendix summarizes information in the basic reference for species of birds. There is a bibliography of 18 titles. Author's summary: "(1) Among German Falconiformes and Strigiformes, no two congeneric species compete for food in the same habitat. Further, when species in different genera are compared, no two compete for the same food supply, with the apparent exception of the predators upon the vole Microtus arvalis; (2) Microtus arvalis forms the staple food of several species of hawks and owls, of which up to five (none congeneric) may occur together in the same habitat. It is suggested that these predators do not effectively compete with each other because for most of the time Microtus is superabundant, while, when there is a vole minimum, each predator perhaps turns to different prey. The latter suggestion needs investi-

gation; (3) parallels are cited with other foods which are temporarily superabundant, and the observations are briefly related to theories of population interaction."

Food Habits: Of cormorant, double-crested

Cmand, D. N. The cormorant in Ontario, Sylva (Dept. of Lands and Forests of Ontario, Toronto, Canada), 3(1), 1947, pp. 18-23, 4 photos.

Notes on colonies in Ontario and on an investigation of one of them (on Georgian Bay) by J. L. Baillie. Public sentiment, except that of fishermen, was favorable to the birds. The identity of 18 fishes found near nests is recorded; Mr. Baillie concluded that "the cormorants are in no way interfering with bass fishing in the area." The cormorant population at Lake of the Woods increased from about 100 birds in 1927 to 4-6 thousands in 1946. At various times, considerable numbers of the birds were killed by fishermen. Investigations showed that 30-35 percent of the food of cormorants in that locality consisted of commercially valuable fishes. The remainder included some species detrimental to the fishery as competitors and predators. Most damage by the birds is to the catch in pound nets. The fishes concerned are identified by English names and the length and weight of some of the larger specimens eaten by cormorants are given.

Author's conclusion: "The question as to whether the birds should be exterminated or not is a difficult one. Against the fact that they are to a certain extent destructive to some species of commercially important fish, we must set the consideration that they destroy twice as many coarse fish, which are detrimental to the production of commercial fish, as they do commercial fish. Also, to the naturalist, tourist and vacationer, they are an interesting and characteristic item of our fauna, and as such should be given consideration."

Food Habits: Of cottontail

McCabe, Robert A. A winter rabbit browse tally on the University of Wisconsin Arboretum, Trans. Wis. Acad. Sci., Arts, and Letters (Madison), 37 (1945), pp. 15-33, 2 pls., 1 map, 1 table, 1947.

Conditions affecting browsing by cottontails and table showing its type and extent on 108 species of woody plants. The observations are discussed, summarized, and compared with those of other investigators. Bibliography of 5 titles.

Food Habits: Of crow

Leech, Hugh B. Crow eating Serica beetles (Coleoptera, Scarabaeidae), Canadian Entomologist (R. H. Ozburn, Ontario Agr. College, Guelph, Ont., Canada), 79(1), Jan. 1947, p. 4.

Corvus b. hesperis vs. Serica curvata in British Columbia.

Food Habits: Of ducks

Schoffman, Robert J. Food of game ducks at Reelfoot Lake, Tennessee, Report of the Reelfoot Lake Biological Station (Tennessee Acad. Sci., Nashville), 11, Jan. 1947, pp. 4-8, 7 tables.

Tabulation of the results of stomach analyses of 32 mallards, 86 ring-neck ducks, 8 pintails, 7 lesser scaups, 5 ruddy ducks, and 11 miscellaneous game ducks. Frequency of occurrence of food items is stated and in 6 of the 7 tables also, volumetric percentages.

Food Habits: Of eagle, golden

Broun, Maurice. Golden eagle captures red-shouldered hawk, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(2), April 1947, pp. 317-318.

At Hawk Mountain, Pa.

Food Habits: Of ground squirrel, Nelson's

Hawbecker, Albert C. Food and moisture requirements of the Nelson ground squirrel, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 28(2), May 1947, pp. 115-125, 1 pl., 2 figs.

Ammospermophilus nelsoni, California. Description of study area; information on food habits, in part from stomach analysis; notes on foraging habits; need for food of various types; and moisture requirements. Author's summary: "The green parts and seeds of red-stemmed filaree and red brome grass are the main food plants used by the Nelson antelope ground squirrel in the areas studied. Insects, mainly grasshoppers, when available, are a staple of the diet. Seeds of ephedra are used where the shrub exists. Both seeds and insects seem to be a necessity, possibly a source of protein. In general, the type and amount of food found in stomachs seems to depend upon availability rather than upon any other factor. Food is gathered along a route and consumed on the spot or in retreats along that route, depending upon the type of food. The time of day of foraging depends upon the weather. Adults become inactive, to what extent is not yet known, to avoid summer heat and dryness. The young must forage during the summer and do so at the time of lowest daily temperature. Moist food is taken when and in what form possible during the summer." Bibliography of 5 titles.

Food Habits: Of hawks

Bond, R. M. Food items from red-tailed hawk and marsh hawk nests, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(2), March-April 1947, p. 84.

Lists of specifically identified prey.

Food Habits: Of hawks

Schmid, Frederick C. Unusual behavior of a Cooper's hawk, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(2), April 1947, pp. 307-308.

Apparently using drowning as a method of subduing prey (a starling); record of similar action by a sharp-shinned hawk with an English sparrow. Pennsylvania.

Food Habits: Of hawk, red-tailed

Hubbard, Douglass H. Red-tailed hawk feeding on coot, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(2), March-April 1947, pp. 83-84.

Fresno County, California; the victim apparently freshly killed.

Food Habits: Of hawk, sparrow

Knowlton, G. F., and P. E. Telford. Insect food of the eastern sparrow hawk in Cache Valley, Utah, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(2), April 1947, p. 311.

Seasonal synopsis of contents of 68 stomachs; Orthoptera were the most important food item.

Food Habits: Of kite, Mississippi

Allan, Philip F. Notes on Mississippi kites in Hemphill County, Texas, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(2), March-April 1947, pp. 88-89.

Abundance, nesting season, and food are annotated. Cicadas were the common prey at the time but dragonflies, grasshoppers, and a bat were observed to be captured.

Food Habits: Of kite, white-tailed

Stoner, Emerson A. Food of white-tailed kites on the Suisun Marsh, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(2), March-April 1947, pp. 84-85.

Of 29 pellets, all contained remains of Microtus. "Thirteen pellets each consisted of remains of one of these mice, fourteen the remains of two, one contained parts of three, and one pellet contained parts, in addition to Microtus, of one harvest mouse (Reithrodontomys sp.) and one house mouse (Mus musculus)." References to two earlier notes on the food of the species in California.

Food Habits: Of otter

Stophlet, John S. Florida otters eat large terrapin, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 28(2), May 1947, p. 183.

Field observation, Florida; prey Pseudemys

Food Habits: Of owls

Pearson, Oliver P., and Anita K. Pearson. Owl predation in Pennsylvania, with notes on the small mammals of Delaware County, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 28(2), May 1947, pp. 137-147, 1 fig., 3 tables.

Identifications of prey remains from barn owl pellets collected over an 8-months period; the catches of the owls and scientist trappers in the same area differed greatly; there are remarks on food of the same owl for another locality, and on long-eared and short-eared owls. A list of the mammals identified in the study is annotated, especially in relation to the owl predation. "It is obvious that neither owls nor trappers catch a representative sample of the small mammal population. All these facts are in disagreement with McAtee's contention (1932) that a predatory bird captures prey animals approximately in proportion to their numbers." [More careful reading of McAtee's 1932 paper would have revealed that tendencies to indiscriminacy are stressed especially in group predation. The statement that predation tends to be in proportion to population applied to the order of birds as a whole.] Bibliography of 9 titles.

Food Habits: Of owl, flammulated

Kenyon, Karl W. Cause of death of a flammulated owl, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(2), March-April 1947, p. 88.

A large long-horned grasshopper lodged in its oesophagus. The stomach contents, insects and phalangids, also are noted.

Food Habits: Of Sceloporus graciosus

Knowlton, George F. Some insect food of an Idaho lizard, Herpetologica (Chapman Grant, 2970 Sixth Ave., San Diego 3, Calif.), 3, 1947, p. 177.

Notes on insect contents of 102 stomachs of Sceloporus g. graciosus from Idaho. There is a supplementary note on aphids eaten by this lizard and also by Uta s. stansburiana in Utah.

Food Habits: Of shrew, water

Lampman, Ben Hur. A note on the predaceous habit of the water shrew, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 28(2), May 1947, p. 181.

Capture of a salmon parr in Oregon.

Food Habits: Of turtle, snapping

Laskey, Amelia R. Snapping turtles apparently preying upon passerine birds, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 64(2), April 1947, pp. 315-316.

Evidence that immigrant snapping turtles were living on bird visitors to a lily pool; Tennessee.

History: Grouse, Ruffed

Schorger, A. W. The ruffed grouse in early Wisconsin, Trans. Wis. Acad. Sci., Arts, and Letters (Madison), 37(1945), pp. 35-90, 1947.

Review of occurrence and abundance of the species, including comment on distribution, decline, wandering, food, and cycles. Instances of "crazy" flight are listed and discussed and "annals" since 1839 are presented. References are given to all of the literature quoted.

History: Pigeon, Passenger

Authors. Silent wings. A memorial to the passenger pigeon. Wisconsin Society for Ornithology (Walter E. Scott, Mendota Beach Heights, Madison 5, Wis. $1.00 a copy), 40 pp., 1 col. and 2 other pls., 11 figs. 1947.

A collection of addresses in connection with the unveiling of a monument to the last passenger pigeon shot in Wisconsin (1899) and other papers on the species. There is a dedicatory speech by Aldo Leopold, chapters on "The Passenger Pigeon in Wisconsin and the Problems in Its History" and "The Great Wisconsin Passenger Pigeon Nesting of 1871" by A. W. Schorger, and one on "Attitude in Conservation" by H. H. T. Jackson. Lesser passages for maintenance of continuity are by Walter E. Scott, editor of the pamphlet. There is a good deal of information on life-history, numbers, and causes of extermination in the contributions of Schorger, who says "All thinking people now realize that man alone was responsible for the extinction of the passenger pigeon."

It is well to recall and commemorate the massacre of this bird but the knowledge drawn from its history should be applied now. Instead, we are still exterminating species and doing so without the excuse of ignorance of the general situation that prevailed at the time of the elimination of the pigeon. On the very lowest terms, it would seem that official conservation organizations and wildlife technicians would see that wildlife is their meal ticket. That alone should make conservation a "must" and render further extinctions unthinkable, but we are still gambling that, some way, wildlife will bear up under the murderous pressure put upon it, without exertion on its behalf, or even a moderate degree of self-denail in exploiting it, on our part. A Washington correspondent (Richard W. Westwood, Editor of Nature Magazine) gives a hint of the situation in the following paragraph of a recent letter: "I spent a day last week attending the 'Hearing' with respect to the fate of our migratory waterfowl in 1947. There were few advocates for the birds among those present and the chief discussion seemed to be how to provide the duck hunters with an opportunity to get as many ducks as possible. My impression is that our migratory waterfowl, perhaps of all species, are headed the way of the passenger pigeon."

Life Histories: Amphibians

Palmer, E. Laurence. Salamanders, toads, and frogs, Cornell Rural School Leaflet (New York State College of Agriculture, Ithaca), 40(4), March 1947, 32 pp., 24 figs.

Collecting and care of specimens; brief general accounts of 4 species of salamanders and 9 of frogs and toads; good photographic illustration of each.

Life Histories: Bear, Black

Thornton, James E. The black bear, Virginia Wildlife (P. O. Box 1642, Richmond 13), 8(3), March 1947, pp. 6-7, 9, 20, 2 photos, 2 figs.

Popular article on sign, habits, food, reproduction, present range in Virginia, and hunting. About 150 killed annually in the State.

Life Histories: Duck, Black

Hagar, Joseph A. Black duck bandings at the Austin Ornithological Research Station on Cape Cod, Massachusetts, Bird-Banding (Charles B. Floyd, 210 South St., Boston, Mass. 75 cents a copy), 17(3), July 1946, pp. 97-124, 1 map, tables; 17(4), Oct. 1946, pp. 145-160, 2 maps, 2 tables; 18(1), Jan. 1947, pp. 17-26, 1 fig., tables.

General account of the work of the Station named. Analysis and discussion of more than 100,000 records of black ducks. From the conclusions of the first installment of the paper we quote: The fact of prime importance about the northward recoveries of banded birds "is their northeasterly direction. Their mass lies that way either in whole or in section. Spring and summer records are numerous north of the St. Lawrence; fall records are concentrated in the Maritime Provinces. The axis of migration is northeast-southwest. Fall migration is earlier on the mainland, delayed in Nova Scotia. The bulk of the birds go back and forth between Cape Cod and Nova Scotia by the direct route over water. For the purposes of management, these conclusions are useful in defining the scope and direction of the problem. If we would understand the status of Black Ducks on Cape Cod, and have studied the winter environment there, we must then look northeast. The number of wintering Blacks on the Cape is largely influenced by what takes place between spring and fall in Newfoundland, Labrador, and eastern Quebec, in New Brunswick, Prince Edward Island, and Nova Scotia."

The second installment discusses southward recoveries of birds banded on Cape Cod and finds movement in that direction unimportant. In terms of management (combining the findings of parts 1 and 2), this means "that the numerical status of Cape Cod black ducks is determined by conditions on the Cape itself and to the northeast in Canada." In part 3, it is shown that results from banding during the nesting season do not differ significantly from those ensuing from banding at other times of the year. All evidence indicates a regional maritime population of black ducks on Cape Cod having its principal affiliations to the northeast in Canada.

Life Histories: Eagle, Bald

Broley, Charles L. Migration and nesting of Florida bald eagles, Wilson Bul. (Josselyn Van Tyne, University of Michigan Museum, Ann Arbor. 50 cents a copy), 59(1), March 1947, pp. 3-20, 3 pls., 1 map, 6 tables.

This paper contains a lot of hard-to-get information on a neglected bird. Data are presented on migration, nesting, and factors affecting survival (including food). There were 47 "recoveries" from 664 banded birds, probably indicating that even Federal legislation for protection of the "national bird" is somewhat disregarded. The migration is to the north and return to the south; some of the birds were recovered more than 1,500 miles north of the nesting area.

Life Histories: Goose, Canada

Kossack, Charles W. Incubation temperatures of Canada geese, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 119-126, 1 pl., 1 fig., 2 tables.

Report on investigations by thermocouple in Illinois. From author's summary: "From this study it has been found that the average incubation temperature of the embryo is 101.3° F., the average shell temperature 100.4° F., the average breast temperature of the incubating goose 101.1° F., the average maximum temperature reached in the nest 101.5° F., and the usual incubation period 26 days. The fact that the incubation period was 5 days longer for eggs in a machine than for eggs under a goose, indicates that the incubator top temperature of 99.5° F., is subnormal and should be raised at least 1.5 to 2 degrees. The temperature rises with the development of the embryo. There is a slight variation in temperature among various birds. The construction of the nest is a vital factor in the variation between top and bottom temperatures of eggs because of the amount of heat that is dissipated into the ground or nesting material on the underside of the egg."

Life Histories: Grosbeak, Black-headed

Weston, Henry G., Jr. Breeding behavior of the black-headed grosbeak, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 49(2), March-April 1947, pp. 54-73, 4 figs., 7 tables.

Habitat, occurrence in the San Francisco Bay region, courtship and territorial behavior, nest building, eggs, incubation, parental care, song and call notes, food habits, and longevity. The article is summarized and includes a bibliography of 11 titles.

Life Histories: Grouse, Sharp-tailed

Scott, J. E. The prairie sharp-tailed grouse (Pediocetes phasianellus campestris), Wisconsin Conservation Bul. (Wisconsin Dept. of Conservation, Madison), 12(2), Feb. 1947, pp. 26-29, 2 figs.

Former and present range of the bird in Wisconsin. Kill: 140,091 in 1933 and an average of 70,000 annually 1939-42. The season has been closed since 1943. At times of peak population, invasions of the birds from other states have occurred. Life history notes, include mating behavior, nesting, food. Sporting value is noted and management suggestions are made.

Life Histories: Grouse, Spruce

Scott, Walter E. The Canada spruce grouse (Canachites canadensis canace), Wisconsin Conservation Bul. (Wisconsin Dept. of Conservation, Madison), 12(3), March 1947, pp. 27-30, 2 photos, 1 map.

Habitat, range in Wisconsin (by text and map), population fluctuations, limiting factors, life history.

Life Histories: Guillemot, Black

Winn, H. Elliott. Black guillemot, Eighth Ann. Rep., Bowdoin Scientific Station (Alfred O. Gross, Bowdoin College, Brunswick, Me.), Bul. 10, April 1947, pp. 21-23 (mimeographed).

Information from a study at Kent Island, Maine, on: nesting, food, young, mortality, behavior, territory, and banding returns.

Life Histories: Gull, Black-backed

Barnes, Albert M. The black-backed gull, Eighth Ann. Rep. Bowdoin Scientific Station (Alfred O. Gross, Bowdoin College, Brunswick, Me.), Bul. 10, April 1947, pp. 18-21 (mimeographed).

In the period 1931-1946, the number of pairs of this species on Kent Island, Maine, increased from 1 to 26. Results of a study here are given as to: migration, territorial behavior, nest, eggs, incubation, young, food, voice, and habits.

Life Histories: Mink

Bradt, G. W. Mink--jack of all trades, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing 13), 16(4), May 1947, p. 4, 1 pl.

General article on: appearance, range, food habits, dens, life history, and economic importance.

Life Histories: Mouse, House

Southern, H. N., and E. M. O. Laurie. The house-mouse (Mus musculus) in corn ricks, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 20 shillings a copy), 15 (2), Nov. 1946, pp. 134-149, 2 pls., 2 figs., 15 tables.

Fluctuations in murine populations, the ferality of house mice by subspecies and as influenced by habitat, and the ecology of the animals in Great Britain are discussed. The authors also deal with the size of corn-rick (i.e. in our usage grain-stack) mouse populations and their seasonal variations, breeding season and alternation of habitat, movements and distribution of the animals within ricks, and rate of damage to the grain. Authors' summary: "(1) In Great Britain the house-mouse (Mus musculus L.) lives mainly in corn ricks and buildings. Populations in country areas alternate seasonally between a high density, while the corn ricks are occupied, and a low density of mice living in the fields when all ricks have been threshed, though there are a few mice living in the fields at all seasons; (2) figures on population density from the Oxford neighbourhood show that badly infested ricks may contain from 1.4 to 14 mice per cu. m. These populations show a rapid rate of occupation of ricks in the autumn, and by January over 90% of ricks are infested. The size of population rises rapidly in the early months after the ricks have been built, reaching a peak in the spring; after a rick is 8 months old there is little if any increase in the mouse population, however long it may stand; (3) counts of mouse-holes in the sides of ricks show that in wheat there is a fairly constant relation between the number of holes and the number of mice. Oat and barley ricks are presumably too loose for any such relation to be established. Counts of holes in wheat ricks through the season show roughly the rate of increase in size of the population; (4) break-back trapping in and around cornfields proved that the house-mouse is the third commonest small mammal living in the fields. After harvest the mice are found around ricks and in the hedgerows nearby, but by autumn they are caught at considerable distances away from rick cover and are obviously living independently of it. During winter the field populations are small, but by spring, possibly increased by large numbers released from ricks at threshing, more of them are found in the cornfields. They have now started to breed at quite a high rate. By the summer this field population is more than sufficient to reinfest the new ricks as they are built; (5) though house-mice rarely come out of corn ricks once they have settled in, their range within the rick is considerable and most of the population visits the external surface of the rick, as proved by poison-baiting experiments in the sides of the rick, which sometimes kill 90% of the population; (6) the amount of damage done by house-mice in corn ricks is difficult to evaluate exactly, but it is shown that, within very approximate limits, an index of this damage is given by the percentage of tailed corn in the total yield at threshing." Bibliography of 15 titles.

Life Histories: Muskrat

Martin, Ernest C. The muskrat comes back, Alabama Conservation (5-7 N. Bainbridge St., Montgomery, Ala.), 18(8), Feb. 1947, pp. 9, 13, 1 photo.

Discussion of origin of the Mobile Delta colony and variations in the population, which was at its peak in 1936-37. Then a drop (perhaps from disease) occurred and the trapping season was closed from 1939 to 1944. In 1946-47, about 7,000 pelts were taken. Brief life history notes. "Natural enemies include the mink, raccoon, hog and alligator."

Life Histories: Muskrat

Sollars, Kathryn. King of the fur bearers, Fauna (34th St. and Girard Ave., Philadelphia 4, Pa. 50 cents a copy), 9(1), March 1947, pp. 23-25, 5 photos.

Popular account of the muskrat, treating range, life history, lodges, habits, enemies, escape and multiplication in Europe, characteristics and value of the fur, muskrat farming, and use of the animals for food.

Life Histories: Opossum

Bradt, G. W. Opossum--invader from the south, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing 13), 16(3), March-April 1947, p. 4, 1 pl.

"There are some records of the opossum in Michigan in the early 1800's, but they seem to have disappeared completely about 1860, and reappeared about the time of World War I. Since about 1927 they have become widely distributed in the southern part of the State." The opossum is a sort of living fossil but succeeds because it eats anything and produces lots of offspring. The author discusses reproduction, death-feigning, food habits, and economic value. "The 'possum population . . . always drops to a low point following a good old fashioned Michigan winter."

Life Histories: Rabbit, Jack

Haskell, Horace S., and Hudson G. Reynolds. Growth, developmental food requirements, and breeding activity of the California jack rabbit, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 28(2), May 1947, pp. 129-136, 1 pl., 5 figs., 1 table.

Lepus c. eremicus in captivity: Behavior and parental relationships; development and growth; forage requirements (0.27 pounds air dry daily); breeding relationships; reproductive potential (14.1 young per female, probably never realized under natural conditions). Bibliography of 7 titles.

Life Histories: Rat, Rice

Hamilton, W. J., Jr. Habits of the swamp rice rat Oryzomys palustris palustris (Harlan), American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 36(3), Nov. 1946, pp. 730-736, 6 figs.

Notes on habits, food, and reproduction in the field and on growth in captivity. Bibliography of 7 titles.

Life Histories: Warbler, Black-poll

Veghte, James H. The black-poll warbler, Eighth Ann. Rep., Bowdoin Scientific Station (Alfred O. Gross, Bowdoin College, Brunswick, Me.), Bul. 10, April 1947, pp. 23-25 (mimeographed).

Investigation at Kent Island, Maine, a southern limit of breeding of this species along the Atlantic Coast; data are presented on: nesting, eggs, young, and voice.

Management: Attracting birds

von Jarchow, B. L. Creating nesting sites for bushnesting birds, Passenger Pigeon (N. R. Barger, 4333 Hillcrest Drive, Madison 5, Misc.), 9(1), Jan. 1947, pp. 3-7, 4 figs.

By pruning or training woody plants so as to increase the number of crotches and other supports for nests.

Management: Beaver

Vesall, David, Robert Gensch, and Ray Nyman. Beaver--timber problem in Minnesota's 'Big Bog.' Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 10(57), March-April 1947, pp. 45-50, 3 photos.

The area is described; it was futilely drained for agriculture in 1915; about two decades later control dams were installed in the ditches to reduce the fire hazard and improve the habitat for waterfowl and other wildlife. Beavers increased and spread but have been trapped annually since 1939 except in 1940 and 1944. The population has remained at about one active colony to each 1.3 miles of ditch. Greater rainfall has been the main factor in increasing damage to timber by flooding. Location and structure of beaver dams are set forth; 77 percent of the dams were in use at the time of the study. There were about 3 dams to a colony. Damage to timber was observed on about 29 acres for each mile of ditch; roads used for logging, patrol, and fire-fighting were inundated or undermined. Timber killed by the beavers would have had a market value of $4,651 per mile of ditch. The annual timber production is worth nearly three times that of beaver pelts. Intangible values of the animals are noted and their consideration in management plans suggested.

Management: Beaver and muskrat

Grange, Wallace. Practical beaver and muskrat farming. Sandhill Press (Babcock, Wis. $1.00 a copy), 52 pp., 8 photos, 1947.

Prefaced by sensible remarks on pelt values and on fur-farming possibilities, besides suggestions as to legal requirements, there are presented accounts of the life-history and propagation of the species named. That for the beaver deals with: general characteristics, restoring beavers for scenic purposes, habitat requirements, foods and increasing the supply, colonizing the animals, harvesting the skins, pelt grades, productivity, beavers in relation to fishes, damage, possible profits, and experimental pen-rearing. For the muskrat a general description is given; suggestions are made as to selecting the site for propagation; and habitat requirements, impoundments, water control, foods, productivity, enemies, harvesting, diseases, damage, trapping methods, care of pelts, possible profits, and experimental pen-rearing are treated.

Management: Big game on national forests

Haskell, E. S. Livestock and big game on national forests, National Wool Grower (509 Pacific National Life Bldg., Salt Lake City 1, Utah), 36(8), Aug. 1946, pp. 12-13, 52, 1 photo, 3 tables.

Tables show the numbers of livestock and of deer and elk and their relative use of the forests, converted to animal months in 1921 and 1944. The changes in such usage are also distributed by states. There has been an average decrease of 36.3 percent in livestock, and varying much larger increases in big game utilization of the forests in eleven western states. The matter is presented for interpretation by stockmen. Not enough emphasis is placed on the preferential use of browse by the deer and elk.

Management: Bobwhite in Ohio

Campbell, Lou. Ohio's bob-white protected in 1912, Ohio Conservation Bul. (1106 State Office Bldg., Columbus 15. 10 cents a copy), 11(4), April 1947, p. 20.

The bobwhite was transferred to the songbird list in 1912 and, despite efforts by sportsmen, has been kept there. A new attempt inspires this comment, in part to the effect that the quail might well be hunted in parts of the State where conditions are favorable for the birds. In clean-farmed areas, especially where pheasants are present, bobwhites have decreased, so in the Ohio "pheasant belt" an open season on bobwhite is out of the question. "Many sportsmen are under the impression that sufficient number of birds can be raised in captivity to provide shooting. Practically every mid-West state has experimented along these lines, and all are in accord that stocked birds cannot provide shooting. For reseeding, yes; for shooting, no. The expense of raising birds and their low rate of survival after release rules this out. This is especially true in territory lying near the northern edge of the bob-white's wintering range in which northern Ohio falls."

Management: Elk

Nilsson, Nils N. Rocky Mountain elk, Oregon State Game Commission Bul. (P. O. Box 4136, Portland 8), 2(2), March 1947, pp. 1, 5-7, 5 photos, 1 table.

Greatly depleted by 1918, the elk population was restored by introductions and complete protection until 1933. Results of the 1946 open season are tabulated and discussed. Information is given on weights, growth of antlers, pelage changes, reproduction, movements, and food. Feeding and pasturing habits are similar to those of domestic cattle. Damage is done on farms but ranchers believe that it is practical to graze both big game and livestock on the same range in reasonable numbers. Winter feeding is discussed but not recommended. In range management it is much better to have a surplus of forage than of animals to eat it. Proper herd limitation is to the safe carrying capacity of the winter range.

Management: Farm Wildlife

Stevens, Mary Lou. Farm wildlife conservation in Maryland, Maryland Conservationist (512 Munsey Bldg., Baltimore 2, Md.), 24(1), Winter 1947.(May), pp. 26-27, 29.

A general essay commenting on early abundance of wildlife, classifying farm representatives of it, pointing out the importance of good habitat, discussing values, limiting factors, and management. Bibliography of 7 titles.

Management: Forest Wildlife

Aldous, Shaler E. Some forest-wildlife problems in the Lake States, Lake States Forest Experiment Station, University Farm (St. Paul 1, Minn.), Station Paper 6, Jan. 1947, 11 pp. (mimeographed).

Review of findings by biologists of the Fish and Wildlife Service in studies from 1930 to date. They have related to the snowshoe hare, white-tailed deer, porcupine, beaver, small rodents and birds as seed destroyers, and the moose overpopulation of Isle Royale. There is a 4-page bibliography.

Management: Gull, Herring

Paynter, Raymond A., Jr. Preliminary report on the effects of egging on the clutch size of Kent Island herring gulls, Eighth Ann. Rep., Bowdoin Scientific Station (Alfred O. Gross, Bowdoin College, Brunswick, Me.), Bul. 10, April 1947, pp. 11-12 (mimeographed).

The gathering of eggs of herring gulls for food is traditional on the northeast coast. This study was to learn the effects of "egging". Twelve eggs are known to have been laid by a single female whose nest was systematically robbed. Under such exploitation, later clutches have fewer eggs than earlier ones and it is concluded that egging can reduce the herring gull population.

Management: Harvest

Bellrose, Frank C., Jr. Analysis of methods used in determining game kill, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 105-119, 1 fig., 8 tables.

Reasonably accurate kill figures are necessary to sound game management. A variety of methods that have been used in this field are reviewed. Illinois experience with hunting club reports, calculations based on acreage and upon band returns, and license and application reports is set forth. The principal methods are further discussed and evaluated and recommendations are made. Author's summary: "Almost every state has attempted to obtain state-wide data on game kill, and almost every state has done so by means of application reports, license reports, or questionnaires. Since return of the report forms is incomplete, practically all states have compensated for non-reporting hunter by assuming that his kill is the same as that of the reporting hunter. Data pre-

sented in this paper reveal that this practice results in erroneously high figures because the proportion of successful hunters who report is greater than the proportion of unsuccessful ones. Furthermore, most hunters, especially those who have bagged many game animals, exaggerate their kill figures. There is also a tendency for hunters to report for their home counties game kills made in 'foreign' counties. A partial correcting factor for these errors might be obtained from local kill data, which, for example, could be collected through checking stations. Obtaining data from a sample of non-reporting hunters, as practised in Indiana, provides a possible correcting factor for differences in the kill of reporting and non-reporting hunters but not for exaggerated reported kills. Because state-wide methods of obtaining kill data through application reports, license reports, or questionnaires are open to appreciable error, it may be more expedient for game management purposes to use checking stations, county-wide interview surveys, or special calendars--adapted for recording game kill data--to obtain pertinent game kill statistics." Bibliography of 9 titles.

Management: Harvest, muskrat

Kellogg, Chas. E. Muskrat pelts: sectional and seasonal effects on grades, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 153-161, 2 figs., 7 tables.

Report on the grading of muskrat skins taken on several Federal wildlife refuges. Tables show linear and areal measurements of random samples of pelts, percentage distribution of quality of fur and pelt in relation to primeness, percentage distribution by size of skins, and of degree of primeness of damaged skins in relation to seasons, and estimate of relative percentage value of various grades of skins from the Tule Lake Refuge. Actual values are not stated but the entire analysis offers guidance for the most efficient harvesting of muskrat pelts.

Management: Inventory, California sea lions

Anon. California sea lion census for 1946, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 33(1), March 1947, pp. 19-22, 1 photo, 1 table.

The number of sea lions counted in various years, 1927-1946, is tabulated; a good increase is shown. Information is given on the species concerned and on methods of counting the animals. Controversy over their economic tendencies is discussed. Author's conclusions: "Present laws empower the California Division of Fish and Game to reduce the herd, if such reduction appears advisable, and practical means for reduction are now being worked out. It is hoped that a system of permits will prove satisfactory. Under such permits, private individuals will be allowed to take a certain number of animals for commercial use, chiefly reduction into meal and oil. Two such permits have been issued and to date one hundred sea lions have been taken north of Point Conception and one hundred ten south. Permits are also issued for the taking of California sea lions for zoos and for trained animal acts. Such permits

average about one hundred animals each year. In the course of the 1946 survey, in addition to the 12,506 sea lions, 550 harbor seals and 21 elephant seals were counted. The counts of harbor seals are incomplete but it seems probable that the total population does not exceed one thousand animals. Presumably most of the elephant seals in our waters were observed."

Management: Inventory, deer increase

Kelker, George Hills. Computing the rate of increase for deer, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 177-183.

Author's summary: "When the population of any group of animals is known at the start and end of a known period of time, the data may be analyzed to give the average annual rate of increase. Then by inspection of the computed value one may read the per cent gained annually. When this second value is doubled, there is obtained the number of young per female. In the case of deer and other big game, this latter value is identical to the count of fawns per doe which is so readily obtained in winter counts. Because big game herds include the sterile yearling group, a corrected value must be interpolated from a prepared table to give the survival number of fawns per breeding female. The fourth step in the computations on populations may give an index to the fertility of the herd. Such computations are now possible since census methods have been developed to give accurate counts on deer herds. Our calculations have shown annual increases of 11 per cent to 20 per cent, a reported one of 19 per cent, and a computed value of 65 per cent. The biological maximum for deer is 66 per cent annually, but in wild herds it cannot exceed 62 per cent. Therefore, when yearling females are sterile, the maximum rate of increase for deer herds is 1.62 compounded annually." Bibliography of 9 titles.

Management: Inventory, mast yield

Allen, Durward L., and Howard D. McGinley. A method for the year-to-year measurement of mast yields, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 184-185, 1 fig.

By sampling the production of fully-crowned, isolated trees; the method is described.

Management: Land in relation to wildlife

Graham, Edward H. The land and wildlife. Oxford University Press (114 Fifth Ave., New York, N. Y. $4.00 a copy), xiii+232 pp., 32 pls., 1947.

From wide-reaching and informed understanding, the writer devotes chapters to our cultural debt to wildlife and to customs and laws relating to it. Then relations of mankind and wildlife are traced through three centuries--pre-Colombian to the present. All of this forms a pleasant and useful prelude to the main theme, namely, that proper attention to the land is also the best way of benefitting wildlife. Ways of obtaining maximum combined values are dis-

cussed for marshes and swamps, ponds and waters, streambanks and ditches, field borders and roadsides, windbreaks and hedges, gullies, odd areas, and spoil-banks, cropland, pasture, and woodlot, and forests and range. He then deals with the demand and supply, unwanted wildlife, and the cost and the harvest. The book is summarized in a chapter on wildlife, land, and people. "When we have learned to conserve the land and, in our use of it, handle every unit and every parcel in accordance with its capacity for use, we shall have contributed materially to the benefit of our nation's wildlife. For when all is said and done, it is a home that wildlife needs above all else: a place to feed, hide, raise its young, sleep, play, and seek shelter. The way we manage the land determines whether wildlife shall have a place. The land-use practices described in this book are believed to be some of those that provide a place for wildlife as an integral part of the new land pattern that is taking shape. When we have accomplished land conservation, we shall have gone a long way toward achieving wildlife conservation."

There is a 13-page, annotated bibliography and an index. A valuable companion volume to the author's "Natural Principles of Land Use" (1943) (abstracted in WILDLIFE REVIEW No. 40, June 1944, pp. 16-17).

Management: Nest-boxes

Cook, David B. A useful nestbox design, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, P. $1.00 a copy), 11(2), April 1947, pp. 185-188, 1 fig.

Advantages and disadvantages of nest boxes are discussed and 5 items of the literature are briefly abstracted. Description and illustrations of a low-cost house are presented. Acceptance of boxes of this type has been good. "It is simple and rugged. It can be built from standard materials that can be readily had from salvage. The cash cost should not exceed 10 cents per box. It has a tight and permanently-attached roof, good drainage, adequate ventilation. By opening the front, the contents can be examined without disturbing either the nest or its occupants, a point of major importance where research work is in progress. Cleaning is quickly and easily done."

Management: Overpopulations, deer

Leopold, Aldo, Lyle K. Sowls, and David L. Spencer. A survey of over-populated deer ranges in the United States, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 162-177, 1 map, 2 tables.

of,

The authors note the sources, and deficiencies in, their data, explain the assumption that the sequence of events in the Kaibab overpopulation is taken as the "normal", and define terms used in their paper. Problem areas are listed by states and annotated and mapped. Analysis of the situation shows: that 47 states have deer and 30 of them have overpopulation troubles in some degree; that there has been an acceleration in irruptive phenomena and in remedial measures; and that the latter have seldom accomplished their purpose. As to the behavior of browse plants in overpopulated areas, it is apparent that as palatable kinds are depleted, their place tends to be usurped by unpalatable

species. Nowhere has winter feeding proved satisfactory. Starving deer do not disperse in search of food and attempts to scatter them have not been successful. Plant food accumulated when deer were scarce helped to build up populations that could not be supported by the normal annual browse production. Deer overpopulations are fostered by the gregarious habits of these animals, but a small percentage drift and may establish new colonies. Appraisal of irruptive conditions should be based on the condition of the browse, not on the numbers of the deer.

Authors' summary: "Prior to the turn of the century, the prevalent population problem in deer was scarcity. Since that time, about a hundred herds of deer, varying in size from a small refuge to half a state, have pyramided their numbers to the point of presenting a problem. Of these, over half are known to have reached a population peak, nearly half are known to have exhibited starvation, and nearly half are known to have been reduced by legalized killing of females. The deer problem on most western ranges is complicated by livestock problems and often by elk problems. Starvation occurs because the deer kill their natural food plants by overbrowsing. These are then replaced by plants of little or no food value. The post-irruptive carrying capacity has been estimated, in various cases, at from near-zero to half of the pre-irruptive capacity. The smaller deer starve first. Malnutrition, diseases, parasites, and predation on weakened animals accompany starvation. Mild winters, artificial feeding, and down tops from logging often postpone, but never prevent, the ultimate shrinkage of both the herd and its range. Buck laws, predator control, and over-large refuges, working in combination to allow undue multiplication of breeding females, seem to be the predisposing causes of irruptive behavior. Prior loggings and fires, by renewing the plant succession, tend to increase deer foods on the eastern ranges. Fire protection later brings a sharp decrease in food supply when closure of the forest canopy shades out intolerant food plants. Only about a tenth of the known problem areas are reported as stabilized as of 1945. Most of the remedial reductions have been too late, too light, or too intermittent to accomplish their purpose."

Management: Overpopulations, deer, white-tailed

Seamans, Roger A. The time is now! A pictorial story of Vermont's deer herd. Vermont Fish and Game Service (Montpelier) State Bul., Pittman-Robertson Series 15, 48 pp. (photos exceed the text in area), 1946 (1947).

Deer irruptions and the need for their control are tardily and reluctantly recognized by the public. Instances in other states are reviewed and the growing problem in Vermont is set forth. Suggestions are made as to what should be done. The story is largely told by a lavish use of photographs with explanatory legends.

Management: Pheasant

English, P. F. Pheasant management on farms, Pennsylvania Farmer (15 North Front St., Harrisburg, Pa.), 136(8), April 1947, pp. 7, 13, 29, 4 photos.

For management purposes, wildlife may be classed in 8 groups, which are defined. Ten factors which should be coordinated in good management of farm wildlife are listed. Although such management must be secondary to usual farm objectives, it can be both practical and profitable. The farm wildlife of Pennsylvania is classified as to economic values to indicate which kinds should be encouraged and which repressed. Management of the pheasant, as an example, is discussed in relation to the seasonal needs and movements of the birds. Attention is given to the balance between food and cover facilities and to food-producing plants. A management outline is presented as a reminder of things to do throughout the year.

Management: Planting eelgrass

Addy, C. E. Eel grass planting guide, Maryland Conservationist (512 Munsey Bldg., Baltimore 2, Md.), 24(1), Winter 1947 (May), pp. 16-17.

Brief account of eelgrass decline and partial recovery, value of the plant as food for waterfowl, and otherwise ecologically and commercially. Recommendations for propagation by seed and for transplanting.

Management: Planting for wildlife

Chapman, Floyd B. Developing game range in Ohio through free distribution of nursery stock to farmers, Journ. Forestry (825 Mills Bldg., Washington 6, D. C. 60 cents a copy), 45(5), May 1947, pp. 354-355.

In a Federal Aid project, more than two million seedling trees and shrubs have been distributed. Details of the operation are given, including names of the plants used. The program has had best acceptance in eastern Ohio where much cleared land is reverting to forest. There it promises to aid greatly in the development of ruffed grouse habitat.

Management: Planting for wildlife, apples

Chapman, Floyd B. The apples in wild life conservation, Ohio Conservation Bul. (1106 State Office Bldg., Columbus 15, Ohio. 10 cents a copy), 11(5), May 1947, pp. 14-15, 2 photos.

"The apples are one of the most valuable of all plant groups for wildlife." Illustrative comment follows and damage to orchards by deer, rabbits, and mice is noted. Seedling apple trees are abundant and can be protected or released to the advantage of wildlife. Other management suggestions are made. [The abstracter is unaware of the source of an apple name attributed to him in this article.] The crab-apple group also is considered.

Management: Planting for wildlife, pines

Chapman, Floyd B. The pine trees in wild life conservation, Ohio Conservation Bul. (Division of Conservation and Natural Resources, 1106 State Office Bldg., Columbus 15, Ohio. 10 cents a copy), 11(3), March 1947, pp. 14-15, 3 photos.

Utilization of pines by wildlife. Solid plantations are wildlife deserts for many years. Staggered planting in long and narrow, rather than square, blocks is recommended. Values of pines other than for wildlife are indicated and species suitable for growth in the State are suggested.

Management: Public shooting grounds

Blair, Frank D. Public hunting grounds today and tomorrow, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 10(57), March-April 1947, pp. 13-16, 1 photo.

Including Federal Wildlife Refuge and National Forest lands, a total of more than 10,000,000 acres of land and 2,000,000 acres of water are available for public shooting. The units are listed, their areas recorded, and their principal game species mentioned. On state-owned tracts not more than a third of each area may be established as a game refuge. Under management, wildlife production has steadily increased on these lands. Plans for the future are outlined.

Management: Refuge

Carson, Rachel L. Parker River--A New England conservation project, Bul. Massachusetts Audubon Soc. (155 Newbury St., Boston 16, Mass. 20 cents a copy), 36(2), March 1947, pp. 51-61, 10 photos.

Description of the area which is part of a historically important travel lane for waterfowl and shore birds. The principal species occurring there and their abundance are noted. The area is an important unit in an east coast chain of migratory bird refuges and is of special value to the black duck. The use by waterfowl of other refuges on the Atlantic seaboard is cited as indicating the potentialities of the Parker River area. Plans for its development are stated.

Management: Refuge

Crichton, V. The Chapleau Crown Game Preserve, Sylva (Dept. of Lands and Forests of Ontario, Toronto, Canada), 3(1), 1947, pp. 33-42, 6 photos.

A vast wilderness area east of Lake Superior set aside as a game preserve, primarily to check depletion of fur animals. Its boundaries, characteristics, and history are set forth. Warden service to control poaching is described. Wildlife has notably increased and trappers near the preserve have greatly benefitted. A beaver dam made of stones, from 5 to 8 inches in diameter, is described and similar ones elsewhere are mentioned.

Management: Stocking, pheasant

Hjersman, Henry A. A history of the establishment of the ring-necked pheasant in California, California Fish and Game (Ferry Bldg., San Francisco 11), 33(1), March 1947, pp. 3-11, 2 maps, 3 tables.

The earliest liberation by the State Board of Fish Commissioners was in 1889 but there had been earlier private plantings. A State game farm was established in 1908; releases from its production 1909-1918 are tabulated and their distribution shown on a map. A table shows the estimated ringneck population by counties in 1916. This venture came to an end but another farm organized in 1925 has been maintained to the present. Its releases also are tabulated and mapped. Production in the wild is satisfactory and, barring detrimental changes in agricultural practices, probably will so continue.

Management: Stocking, upland game birds

Barnes, Wm. B. Is artificial propagation the answer?, Outdoor Indiana (401 State Library Bldg., Indianapolis 9, Ind.), 14(2), April 1947, pp. 8-10, 1 photo.

Review of Indiana stocking operations with 4 species of game birds (3 exotic), and of similar activities in other mid-west states. A Pittman-Robertson study of quail releases resulted in the return in 3-1/2 years of 3.3 percent of the bands placed on 6,098 eight-weeks-old bobwhites. In general these birds did not disperse widely; the longest distance travelled was 13-1/2 miles. In a similar study of pheasants, 4.4 percent of the bands were returned. These birds were greater wanderers, one of them to the extent of 97 miles. From chukar partridges, the returns amounted to 13.6 percent, predators being responsible for 78 percent of the deaths. Hungarian partridges were distributed to all parts of the State but became established only in the northeast, especially on clay soils. The advantage of stocking this species and the pheasant is that they are able to exist with less cover than the native species, which clearing and clean farming had generally eliminated. As to cost of restocking, it has been about $2 per bird released and $40 for each one bagged by hunters. Fluctuations in game bird populations have not been eliminated by restocking. For pheasants, in 1945, pen-reared birds provided only 6 percent of the total bag and for quail, less than one percent. Artificial propagation is not the answer to Indiana's game bird problem.

Management: Turkey

Bick, George H. The wild turkey in Louisiana, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 126-139, 4 figs., 2 tables.

A Pittman-Robertson project. The history of the wild turkey in Louisiana and of the State hunting regulations is summarized. Report on a questionary inventory and poll of public sentiment. Original and present ranges of the bird in the State are mapped. The ecology of present range is discussed and management recommendations made, chiefly as to reservations. Author's summary: "The original range of the wild turkey in Louisiana comprised 40 parishes and approximately 28,000 square miles and occurred in two large blocks constituting (1) all of the state east of the Mississippi River and north of Lake Pontchartrain, (2) that portion north of an irregular line drawn from the northwestern corner of West Feliciana to the southwestern corner of Calcasieu Parish. The 1942 population was 158 flocks which occupied approximately 1,320 square miles or 5 per

cent of the original range. The occupied range consists of small, widely separated and sharply limited units. Seventy-eight per cent of the population occurred in bottomland hardwood forests. Forty-two per cent of the population was found on or just adjacent to protected areas; these were the Singer-Ayer Refuge, the Morehouse Refuge, and the Urania Forest. Significant turkey populations were associated with a low human farm population. But the average size of the farm and the average per cent of the parish in cultivation was identical for occupied parishes and for the state average. The Singer-Ayer Refuge can not be considered as permanent range because of encroaching agriculture. It is suggested that the turkey population here be removed to areas where permanent management is possible. The creation of management areas is suggested for four areas within the occupied range: (1) the juncture of Winn, Caldwell, and LaSalle Parishes; (2) the northern part of Livingston Parish; (3) the Pearl River bottomlands in St. Tammany and Washington Parishes; (4) the West Bay area of Allen Parish. Restoration in unoccupied areas should be centered in the north central part of the state where the range is for the most part suitable and where federal forest land is available. Restoration can be accomplished but extreme steps and an aggressive action program are required." Bibliography of 26 titles.

Management: Turkey

Glover, Fred A. The West Virginia wild turkey, Redstart (Brooks Bird Club, Wheeling, W. Va.), 14(7), April 1947, pp. 38-40 (mimeographed).

Preliminary report on a Pittman-Robertson project. Notes on the range of the bird in the State where some 3,500 to 4,000 birds are estimated to be present, mostly in the poorer parts of the original range. Most of man's activities are inimical to the turkey. Seasonal habits are sketched and management suggestions are made. Recommended practices are: "(1) The maintaining of sod areas from 1 to 50 acres; (2) the maintaining of old roads and forest trails as avenues of travel; (3) the freeing of such important turkey food producers as wild grape, beech, black cherry, oak, and blackberry; (4) the planting of natural foods along trails, old fields, and streams; (5) the cleaning out of springs to provide water during the late summer and feeding areas in the winter; and (6) the regulation of the take from hunting. Local predator control may be needed at times. Emergency winter feeding need not be extensive and is necessary only under severe, incldment weather."

Management: Wet lands

Scott, Walter E. The "Old North" returns. A study of wildlife in Central Wisconsin with special reference to recent hunting seasons, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison), 12(4), April 1947, pp. 13-27, 8 photos, 1 map.

Account of an area formerly considered northern but in what is now central Wisconsin, which contains the largest swamp and a great proportion of the sandy lands of the State. The tract was lumbered off, and farming was tried with characteristic lack of success. A chronology of events of wildlife relationship is presented, establishment of forest reserves and public hunting grounds is noted, and recent harvests of wildlife are reviewed. The essential

facts are summarized as follows: "(1) Much of the Central Area has been found wanting for good agricultural development and has been rededicated to forestry, wildlife and recreational purposes; (2) protection from fires, maintenance of dams for flowages and forest planting is increasing the density of the cover and helping to maintain more wet inaccessible areas of importance to wildlife. But extensive fires in the past decade encouraged the growth of vast areas of aspen and other inferior cover of negative value to prairie grouse and possibly to other wildlife; (3) extensive areas of public lands are being used by the people of the state, but largely for hunting, fishing, and trapping by sportsmen. Few resorts are found in the area because about half the people of the state live within 100 miles and all within 150 miles of the area's center; (4) local waterfowl are being over-shot and fur bearing animals over-trapped. In grouse seasons, there may also be excessive harvesting. The deer population has continued to increase in spite of heavy legal harvests and illegal killing. Deer damage to agricultural crops is higher than anywhere in the state and overbrowsing of available food and damage to forest plantations is a matter of concern. Concentrations of hunters, especially in deer season, cause 'hot spots' where the kill of protected deer is intensified."

Management problems are stated and suggestions made. "This is the area that once was the home of 360 million passenger pigeons--the largest nesting ever recorded anywhere; this is the area which once had the largest stand of prairie chicken anywhere in the Middle-west; this is the area which now has one of the heaviest populations of deer in the entire country, within a few hours' distance of several million people. What will man do this time to 'manage' this natural resource?" Bibliography of 22 titles.

Management: Wildlife in national parks

Cahalane, Victor H. Wildlife management in the National Park system, Yosemite Nature Notes (Yosemite National Park, Calif.), 26(5), May 1947, pp. 66-70.

The perpetuation of certain species is directly dependent on the protection afforded by the national parks. The rate of extinction of wildlife forms is accelerating and in almost every extinction [so-called] civilized man has been at fault. In wilderness areas to which wildlife is adapted, species can be preserved by protecting them and refraining from meddling with their lives. Sometimes, where conditions have been disturbed, help must be extended if certain species are to survive. Reintroductions, if tried at all, should be of the same form but should not be undertaken unless careful study reveals the environment is again wholly capable of supporting them. In some instances, overpopulations occur; then the National Park Service prefers that the problem be solved by natural controls or by action outside of park boundaries. If a herd does not move beyond those limits, it may become necessary to reduce its numbers within the park. This should not be permitted to develop into a system of hunting within parks, which would radically change the concept of park management. It would then be for a minority--the hunters--instead of for the general public. Despite long interference, aquatic life also should be brought back to an approximation of its original composition. This will require many years. Well-trained biologists, and more of them than now available, are needed for adequate management of wildlife in the national parks.

Management: Winter feeding

Bersing, Otis S. Winter bird feeding, Wisconsin Conservation Bul. (Wisconsin Dept. of Conservation, Madison), 12(3), March 1947, pp. 13-14, 4 photos.

Account of state and locally organized projects for 1946-47; the illustrations show 5 species of upland game birds at feeding stations.

Natural History: Birds of Yukon

Rand, A. L. List of Yukon birds and those of the Canol Road, Nat. Mus. of Canada (Ottawa), Bul. 105, 76 pp., 1 map, (1946) 1947 (25 cents a copy).

General comment relates to the area and to previous ornithological work in it; there is an annotated list of 173 species and subspecies, a 2-page bibliography, and an index.

Natural History: Hares

Leopold, Aldo. The distribution of Wisconsin hares, Trans. Wis. Acad. Sci., Arts, and Letters (Madison), 37(1945), pp. 1-14, 2 maps, 1947.

Former and present ranges of the jack rabbit and snowshoe hare, especially as affected by clearing of the land. Bibliography of 19 titles.

Natural History: Longevity, mammals

Linduska, J. P. Longevity of some Michigan farm game mammals, Journ. Mammalogy (Ernest T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 28(2), May 1947, pp. 126-129.

Summary of results from live-trapping of 8 species in Michigan. Bibliography of 5 titles.

Natural History: Prairie chicken

Scott, Walter E. The greater prairie chicken (Tympanuchus cupido americanus), Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison), 12(1), Jan. 1947, pp. 25-27, 2 photos, 1 map.

So far artificial propagation has failed. The population cycle is at a low and fears for the future of the birds are renewed. The bird has been much studied in Wisconsin and papers on its history, habits, food, and management are abstracted. The map shows the distribution of pinnated and sharp-tailed grouse in the State in 1938.

Natural History: Salientian eggs

Livezey, Robert L., and A. H. Wright. A synoptic key to the salientian eggs of the United States, Amer. Midland Nat. (Notre Dame, Ind. $1.00 a copy), 37(1), Jan. 1947, pp. 179-222, 5 pls.

The eggs and egg-laying habits of Usonian tailless amphibians are discussed; a key with elucidative illustrations is presented; and comment is added to bring out information lacking in the key. Four-page bibliography.

Natural History: Snakes

Kelly, Howard A., Audrey W. Davis, and H. G. Robertson. Venomous snakes, Maryland Conservationist (512 Munsey Bldg., Baltimore 2, Md.), 24(1), Winter 1947 (May), pp. 10-13, 19, 2 figs.

General information on pit-vipers and on the two species indigenous to Maryland: the copperhead and timber rattlesnake. Discussion of the effects of snake venoms and of treatment for snake-bites.

Propagation: Partridge, Chukar

Grimmer, Wm. F. Breeding chukar partridges, Modern Game Breeding (J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa. 25 cents a copy), 17(4), April 1947, p. [5].

Succinct instructions.

Propagation: Raising maggots

Frings, Hubert. A simple method of rearing blowflies without meat, Science (1515 Massachusetts Ave., N. W., Washington 5, D. C. 25 cents a copy), 105(2731), May 2, 1947, p. 482.

Although maggots are not so much used as formerly in game bird rearing, the method of producing them described in this paper may be of value to some breeders. Moistened dog biscuit in mason jars, furnished with a wire mesh cover is the equipment. The larvae can be scoured in meal. The eggs of the blowflies were collected on meat and transferred to the dog biscuit pabulum. Objectionable odors are prectically eliminated, hence the maggots can be raised indoors.

Propagation: Terrapin, Diamond-back

Hildebrand, Samuel F., and Herbert F. Prytherch. Diamond-back terrapin culture, U. S. Fish and Wildlife Service (Merchandise Mart, Chicago 54, Ill.), Fishery Leaflet 216, 5 pp. (stencilled), March 1947.

Classification, range, habitat, value, enclosures, reproduction, rearing, feeding, sex ratio (1:6, only the females useful for food), source of breeding stock.

Research: Anesthetizing animals

Rausch, Robert. Suggestions for the handling of certain mammals, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, p. 189.

Subduing with injections of pentobarbital sodium or anesthetizing with chloroform or ether.

Research: Artificial "burrows"

Fuhr, Irvin, and Seymour D. Silver. Simulated burrow systems for studies with rodent pests, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 150-153, 2 figs.

Description and illustrations of two types.

Research: Identification of Medicago seeds

Isely, Duane. Seed characters of alfalfa and certain other species of Medicago, Iowa State College Journ Sci. (Ames, Iowa. $1.25 a copy), 21(2), Jan. 1947, pp. 153-159, 1 pl.

Discussion and illustration of characters, with key to the seeds of 6 species. Bibliography of 6 titles.

Research: Infra-red lighting

Southern, H. N., J. S. Watson, and Dennis Chitty. Watching nocturnal animals by infra-red radiation, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 20 shillings a copy), 15(2), Nov. 1946, pp. 198-202, 2 pls.

An infra-red transmitter and an infra-red sensitive telescope and their use are described. The sensitivity of the eyes of nocturnal animals to infra-red is discussed. "At the moment the situation is as follows: with the telescope and its accompanying headlight, there seems no evidence at all that brown rats are capable of detecting the rays. Observations on habits and location of other nocturnal mammals and birds is therefore likely to be feasible by this method. Under the more intense illumination of the floodlight results are not quite so easy, though this may merely be due to the heat which so powerful a lamp emits." Limitations of available apparatus are discussed and some of the results of watching brown rats are presented. The photographs reproduced evidence the complete ease of some of the subjects; that assumably of a mother and six young is a charming study. The method would seem to be of much promise. Bibliography of 19 titles.

Research: Metabolism of small mammals

Pearson, Oliver P. The rate of metabolism of some small mammals, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 28(2), April 1947, pp. 127-145, 4 figs., 3 tables.

Methods of experimentation are described and the results discussed and summarized. From author's summary: "The rate of metabolism of sixteen species and subspecies of small mammals was measured in a special apparatus so that uninterrupted measurements of the oxygen consumption could be made over a period of 24 hours or longer. The 24-hour averages are given for most species, as well as the maximum, minimum, and 'basal' values. The long-tailed shrew had by far the highest metabolism recorded. Next highest was the short-tailed shrew. The rate of metabolism of both genera of bats was very low during the daytime; almost at hibernating level. Mice capable of hibernation had no such drop. There was a daily metabolic cycle corresponding with the expected activity cycle of the species. Judging from the ratio, metabolism at night / metabolism during the day, little brown bats, big brown bats, flying squirrels, and deer mice were the most nocturnal, Rhoad's red-backed mice and pine mice the least. No species was diurnal. A shorter metabolic cycle lasting an hour or two was noticed in short-tailed shrews, long-tailed shrews, northern deer mice, house mice, white mice, pine mice, red-backed mice, and meadow mice. The rate of metabolism of some species such as pine mice and red-backed mice fluctuated within very narrow limits throughout the 24-hour periods, but among the bats the maximum metabolism was as much as 18 times the minimum." Bibliography of 9 titles.

Research: Seed identification

Martin, A. C. The comparative internal morphology of seeds, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 36(3), Nov. 1946, pp. 513-660, 67 pls., 4 figs.

Brief descriptions and diagrammatic illustrations of the embryo and endosperm of about 1,500 genera of seeds. "With regard to prospective usefulness of this manual to seed identifiers it is freely acknowledged that external features of seeds are, and will continue to be, the principal means of seed identification. Resort to internal characters is advocated not as an independent and adequate basis of identification but as a supplement to determination by external means. To the author, knowledge of internal structure serves as an important, almost indispensable means of ascertaining the general part of the plant kingdom in which an unfamiliar seed belongs and also is a valuable adjunct for verification of determinations based on surface characteristics. It is assumed that this manual will enable others to capitalize on the advantages of this procedure." The bibliography might well have included the "Genera Plantarum" by George Bentham and Joseph Dalton Hooker (London, 3 vols., 1862-1883). These two men who contributed so importantly to major plant taxonomy described the morphology of fruit, seed, and embryo of all the families and of many of the genera and gave it weight in their classification. John Lubbock's "A Contribution to Our Knowledge of Seedlings" (2 vols., London, 1892) also could have been mentioned. It contains figures of many cross-sections of seeds.

Research: Survival ability

Latham, Roger M. Differential ability of male and female game birds to withstand starvation and climatic extremes, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 11(2), April 1947, pp. 139-149, 4 figs., 2 tables.

Tabulation and discussion of information on sex ratios of birds, chiefly game species. Author's summary: "A series of experiments with six different species of game birds, which included 1,332 individuals, pointed toward a significant difference between the sexes in their ability to withstand fasting and climatic extremes. Among polygamous species, the females proved the stronger; and among monogamous species, the reverse was the case." Bibliography of 22 titles.

Research: Trapping

Cockrum, E. Lendell. Effectiveness of live traps versus snap traps, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 28(2), May 1947, p. 186.

Results obtained in Wyoming with traps set in pairs; "the live traps caught at night almost twice as many animals as the snap traps and in the day caught three times as many."

U. S. Government: Federal Aid in Wildlife Restoration

Rutherford, R. M. Federal Aid in Wildlife Restoration. General Information. U. S. Dept. of the Interior, Fish and Wildlife Service (Merchandise Mart, Chicago 54, Ill.), Regulatory Announcement 18, 12 pp., Dec. 1946 (received May 1947).

Contains the text of Federal laws and regulations relating to the work specified and explanatory paragraphs on purpose of the program, state participation in it, types of projects, incidental benefits, unacceptable projects, allocation of funds, and employment of competent personnel.

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U. S. Department of the Interior, Chicago 54, Ill.

291. Abstract of fur laws, 1946-47, by Frank G. Ashbrook, 47 pp., October 1946.

Digest for the states and the Canadian Provinces with addresses from which full texts may be obtained.

293. Bibliography on walrus, by Emma M. Charters, 14 pp., May 1947.

The title is sufficient abstract.

294. Keeping up with the waterfowl, by Frederick C. Lincoln, 10 pp., outside and inside cover cuts, 10 maps, April 1947.

Account of the methods used to make estimates of the number of North American waterfowl. Contains brief information on flyways, banding returns, the refuge system, and crop damage by the birds. Reprinted from Audubon Magazine, July-August 1946.

NOTES AND NEWS

The New Hampshire Fish and Game Department, Concord, needs for its file the following issues of WILDLIFE REVIEW: 1, 2, 3, 18, 19, 20, 21, 22, 24, and 27. Copies of reports on the Biological Surveys of that organization are available for exchange.

The Office of the WILDLIFE REVIEW (Fish and Wildlife Service, Merchandise Mart, Chicago 54, Ill.) is always receptive to back issues of the REVIEW, and upon request will send franks to cover postage on shipments. Any received will be promptly distributed to correspondents in need of them, a file of whose requests is maintained.

The Wildlife Management Institute (822 Investment Bldg., Washington 5, D. C.) issues an Outdoor News Bulletin (processed) devoted to news notes and book reviews in its field.

Frank C. Edminster reports that the following book contains a chapter on "Woodlands and Wildlife": A Guide to Country Living, by A. F. Gustafson, et al. (Comstock Publishing Co., Inc., Ithaca, N. Y. 1947. $4.00 a copy).

Science News Letter (May 10, 1947, p. 297) relates the finding at Vanderbilt University Hospital that streptomycin is a cure for tularemia and for the highly fatal pneumonia that so often accompanies it. As tularemia is not always easily diagnosed, any pneumonia of undetermined cause should be treated with streptomycin without waiting for the results of tests.

Another monument to a bird has been erected in the United States. The story, with two illustrations, may be found in the Wisconsin Conservation Bulletin (12(4), April 1947, pp. 1-12). It is by Walter E. Scott, and is entitled "Monument Erected to Passenger Pigeon." Part of the legend: "This species became extinct through the avarice and thoughtlessness of man." See also page 17 this issue of WILDLIFE REVIEW.

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